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paper suffer no change, I am not then afraid of exposing it to the sun for any length of time whatever.

In conclusion, I beg to state that I shall be happy to wait on the Committee, and give any additional information that may be required respecting the detail of the process.

J. J. Cooper,
**Resident Chemist Polytechnic Institution.**

*May* 19*th*, 1839.

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### No. II.

## NEW TEST LIQUOR FOR ACIDS AND ALKALIES.

*The Thanks of the Society were voted to Mr. J. Marsh, of the Royal Arsenal, Woolwich, for his Test Liquor for Acids and Alkalies, prepared from the Petals of the Red Dahlia.*

The infusion of the common red cabbage has been long in use in the chemical laboratory, as a test to distinguish acid from alkaline bodies when in solution; and, although possessed of great delicacy in this respect, is still subject to an objection, on account of its becoming so exceedingly offensive in its smell, after having been prepared a few months.

In order to obviate this objection, I undertook some experiments, about two years ago, on the colouring matter of the dark red hollyhock, the purple radish, and the dark red beetroot; but, during my experiments, I found many objections to all. The beautiful blue colour of the dark red hollyhock, obtained by alcohol, is, however, worthy of notice; but I have not had time to look much to it during my experiments on this subject, my attention being forcibly drawn to the beautifully coloured infusion obtained from the dark varieties of the dahlia, such as the Conqueror of Sussex, Sir Ed. Codrington, Sir E. Sugden, Alman's Splendissima, Parson's Rival, Brown's Ion, Holmes's Rival, Sussex Lima, Metropolitan Perfection, Pasha of Egypt, Robert le Diable, and Sambo,—these being the varieties that I have mostly employed; there are many more equally as good, but they have not yet fallen in my way.

This infusion is easily obtained as follows:—Into an infusion pot, or any common earthen vessel, let as many of the petals of the above-named dahlias be lightly pressed, and then boiling hot distilled or good rain-water, sufficient to cover the petals about an inch, be introduced. The best method of keeping them down is by means of a piece of plate-glass, or the foot of a broken tumbler, or even a piece of common porcelain will do very well. The whole may be kept on the hob of a common fireplace, simmering for two or three hours, covered over with a piece of common paper, to keep out any dirt which otherwise might fall in. The liquor is then to be poured off the petals, which will be found almost colourless. To every pint of the infusion add half an ounce of sulphuric acid, keeping the whole slowly stirred with a slip of glass. When quite cold, add to every pint of the mixture two grains of corrosive sublimate dissolved in a portion of the liquor: filter the whole through a piece of coarse cloth, and bottle it up; and it is immediately fit for use.

When wanted for use, the liquor is to be carefully neutralised by ammonia, which gives it a kind of olive colour, and in this state it may be used liquid; or bibulous paper may be dipped in it, and then dried. Either the liquor or the paper will become green with alkalies, and red with acids.

Being desirous of turning to account some of the qualities of this class of flowers now so much cultivated and so generally admired, and also of rendering them useful as well as ornamental, I have made several attempts to fix it as a dye-stuff on cloths, &c.; but have not yet succeeded in my attempts to my own satisfaction.

The great abundance of these flowers, and the ease with which they can be obtained (as they answer every purpose after having been exhibited), together with the simple method of obtaining this test liquor, will, I hope, be thought worthy of the attention of the Society of Arts. In conclusion, I beg to add, it has been approved of and adopted at the Royal Military Academy and Royal Institution; and any further information that the Society may require in regard to this subject, I shall feel much real pleasure in communicating when the Society may honour me with their commands.

I am, Sir, &c. &c.

J. Marsh.

*Woolwich, 22d March*, 1839.

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My dear Sir, *London, April* 4, 1839.

I have examined the test liquor which you were kind enough to send me, and find it most excellent for the purpose of ascertaining the percentage of alkaline salts; its extreme cheapness is a great recommendation, as it may be used with more freedom than the litmus, to which, in point of delicacy, it is fully equal.

I am, Sir, &c. &c.

*J. Marsh, Esq.* LEWIS THOMPSON.
*Woolwich.*